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CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 8 June 1999 with an application for Letters Patent number 336144 made by QPOD SYSTEMS LTD.

Dated 9 June 2000.

Neville Harris

Neville Harris
Commissioner of Patents



336 144

NEW ZEALAND

Patents Act 1953

PROVISIONAL SPECIFICATION

Title: Container

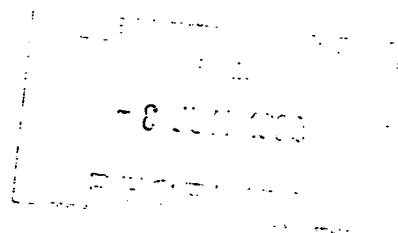
We, *QPod Systems Limited*,

Nationality: *New Zealand*

Address: *2/174 Marua Rd, Mt Wellington, Auckland, New Zealand;*

do hereby declare this invention to be described in the following statement :

- 1 -



TECHNICAL FIELD

This invention relates to a container which has been devised particularly though not necessarily solely for the transport of fresh produce. It is envisaged however that other items
5 such as semiconductors and the like could also be transported in the containers of the invention.

BACKGROUND

There is a continuing need to provide containers in which the temperature within the container can be controlled in a simple yet effective manner.

10 OBJECT

It is therefore an object of the present invention to provide a container which will go at least some way towards meeting the foregoing desiderata in a simple yet effective manner or which will at least provide the public with a useful choice.

STATEMENT OF INVENTION

15 Accordingly in one aspect the invention may broadly be said to consist in a container comprising a base, four side walls and a top, at least two side walls and at least one of the base and the top having channels therein through which gas can flow.

Preferably gas moving means are provided in the base of the container.

20

Preferably the walls are of a fluted construction so that the flutes provide the channels.

Preferably the base is positioned on a pallet or the base includes a pallet configuration.

Preferably the gas comprises a cooled gas.

Alternatively the gas comprises a heated gas.

Preferably the gas comprises air.

- 5 In a further aspect the invention may broadly be said to consist in a container comprising a base, four side walls and a top, a gas moving device arranged to direct gas up or down one or more side walls and down or up the remaining side walls.

Preferably the gas is directed up two side walls and down two side walls.

Preferably two separate gas paths are provided.

- 10 Preferably the gas moving means is provided in the base or top and directs the gas to side walls and receives gas from two side walls.

Preferably the top includes two chambers or sets of channels, gas in one gas path passing through one chamber or set of channels and gas in the other gas path passing through the other.

- 15 Preferably the base provides a gas receiving chamber and a gas supplying chamber, the gas moving device, moving gas from the gas receiving chamber to the supply chamber.

Preferably the gas passes through channels in the side walls.

Preferably the top is made from fluted cardboard and the walls are made from fluted cardboard.

Preferably the container is insulated.

- 5 Preferably the base chambers formed by first tray open at two side walls, and a second tray open to the other two side walls.

Preferably the base is mounted on a pallet.

Preferably at least the sides and top are insulated at least on the outer surface.

- 10 In a still further aspect the invention may broadly be said to consist in a method of maintaining the temperature of or cooling a container comprises the steps of directing a flow of gas at the desired temperature up or down one or more sides of a container having a top, a bottom, and four side walls and allowing the gas to return down or up the remaining side walls.

Preferably the gas moves up two side walls and down two side walls.

- 15 Preferably the gas moves within the walls of the container.

This invention may also broadly be said to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of the parts, elements or features, and where specific

integers are mentioned herein which have known equivalents such equivalents are deemed to be incorporated herein as if individually set forth.

DRAWINGS

One preferred form of the invention will now be described with reference to the accompanying
5 drawings in which:

- Figure 1 is an exploded view showing in simplified form the base of a container according to the invention;
- Figure 2 is a cross sectional view of the lower end of a container according to one preferred form of the invention;
- 10 Figure 3 is a slightly exploded view of a junction between a wall and the base of the container of Figures 1 and 2;
- Figure 4 is a diagrammatic representation of the walls and top of a container according to the invention;
- Figure 5 is a corner detail of the container of the invention;
- 15 Figure 6 is an enlarged view of the end of a fluted side wall according to the invention;
- Figure 7 is a simplified drawing of an arrangement of the sides of the invention;
- Figure 8 show gas paths across the top of the container in the preferred form of the invention;
- Figure 9 as for Figure 8;

- Figure 10 shows the arrangement of a preferred form of top for the container;
- Figure 11 shows a top corner connector for a preferred container;
- Figure 12 shows a cross section of the connector of Figure 11;
- Figure 13 is a corner assembly for the container of the invention;
- 5 Figure 14 shows Figure 13 in exploded form;
- Figure 15 shows the detail of the junction between the side walls and the base of one intersection thereof being the gas receiving intersection to the base; and
- Figure 16 is a similar detail but showing the gas supply intersection between the base and the side walls; and
- 10 Figure 17 (a) to (n) is a series of drawings showing an erection sequence of a container.

APPLICATIONS

In the preferred form of the invention a container is provided as follows:

- The container comprises a base, a top and four side walls. The base may be mounted on a Pallet 1. Means are provided to move gas in a manner that will be described in more detail
- 15 hereinafter and the means may be in the base or the top. In the preferred form the gas moving device is in the base. In such a construction the base comprises two parts being a lower part 2 and an upper part 3. In the preferred form of the invention gas will be moved up two side walls of the container and down two side walls. Other variations are able to be provided such as up one side and down one side, up three side walls and down one or up one and down three.
- 20 In the up two walls, down two walls version the lower part 2 is provided with a base 4 and

perimeter walls 5 and 6 on two side of the base 4. The upper part 3 has a base 7 and walls 8 and 9 on the two edges thereof which are not provided with walls on the lower part 2. The upper part 3 has a central aperture 10 through which gas can pass. The parts of the plates 4 and 7 which do not have the side walls may have a lower curved side wall 11 thereabouts to assist in directing the in gas flow. A gas moving device such as a radial fan 12 is provided to move gas through the central aperture 10. A top plate 13 is provided above the upper part 3 so that in effect upper and lower chambers are provided in the base along with the gas moving device. A layer of insulation 15 may be provided between the base and the pallet as shown in Figure 3.

10 The walls of the container comprise walls 20, 21, 22 and 23 of which one for example the wall 23 may be in the form of a door. Thus the side walls 21 and 23 for example may be wider than walls 20 and 22 so that walls 21 and 23 overlap the ends of the side walls 20 and 22 as can be seen in Figure 7. In the preferred form of the invention the walls are made from fluted cardboard and a satisfactory cardboard is correctly provided by Carter Holt Harvey Limited and sold under the trade mark M FLUTE. This board provides sufficient rigidity and also provides flutes along which the gas for example air can pass. In the construction as shown in Figure 5 the wall 20 butts against a face of the wall 21 and a tape 25 is passed vertically and around the corners to hold the walls in position. In Figure 6 the wall 21, for example, is shown it can be seen that the outer surface has a double thickness of cardboard at 26 and that the inner wall 27 has been extended around the end of the wall 28 and secured back to the outer surface at 29.

The top includes one or more chambers and a satisfactory construction is substantially as shown in Figure 10 in which two layers of the fluted cardboard are provided being layers 30

and 31 in which the flutes 32 and 33 are substantially at right angles. This keeps the air flows separate and enables the air to pass up one wall such as wall 20 through flutes such as flutes 33 and down the other side wall such as side wall 22. It will be apparent of course that a single plenum could be provided or two plenum chambers without the flutes but it is believed
5 that the preferred embodiment comprises the construction as shown in Figure 10. Figure 11 shows one way of completing gas passageways from say wall 20 to top part 30. A connector 45 is provided having gas passageways 48 between face 46 and face 47. There may be dividers 49 within the passageways 48. The faces 46 and 47 are recessed at 50, 51 to provide a female member into which the side panel 20 and top panel 30 engage. Other connections
10 can be similarly made.

Thus by reference to Figure 8 air passes up wall 20 into top part 30 and down walls 22. Figure 13 shows the corner assembly which it can be seen that the flutes in wall 20 terminate at a lower level than the flutes in wall 21 and the extension 35 can be seen. The inner face of the walls could have the cardboard replaced by material which transfers heat more readily but
15 which gives sufficient strength such as a metal sheet for example although this has the disadvantage that the container walls may not be so readily disposed of at the receiving end. Also an array of holes could be provided on the gas supplying and gas receiving walls so that the gas passes through the produce rather than over the top or as well as through the top. Such a construction is of particular advantage when the produce is horticultural items. In such a
20 construction selected pathways can be blocked to force flow through the produce.

Air flows up two opposite sides and down the remaining two opposite sides are also possible. That is the air flow is across a corner.

Referring to Figures 15 and Figures 16 it can be seen that air will return down the side flutes for example wall 23 in the direction of arrow 40. The gas moving device 12 such as a radial fan will move that gas through the aperture 10 into the lower chamber where it is enabled to move up the flutes in wall 21.

- 5 In one base chamber a refrigeration unit (not shown) or heating unit is provided. It is expected that in almost all cases a cooling unit will be provided.

In use the door 23 is opened and produce or items stacked within the container. The door 23 is closed and insulation panels 50 indicated in Figure 2 and 3 are placed about the container. These are then taped so as to be secure in position and a tape is indicated at Figure 51. Other
10 fixing devices could be used as available.

Once closed the container of the invention may be shipped as desired for example within a shipping container or individually as suitable.

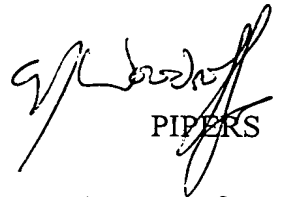
Power is supplied to the gas moving device 12 and air (or other gas if utilised) is moved up to or in some cases one or three side walls across the top of the container (unless blocked to
15 direct the flow through the produce) and down the remaining two or three or one side walls back into the base. It will be apparent that the roles of the base and top could be reversed in some instances although having the cooling and gas moving functions in the base enables it is believed a simpler construction. The construction has the advantage of shipping a collapsible container on a pallet.

- 20 Figure 17 part (a) to (n) show an assembly sequence of the construction.

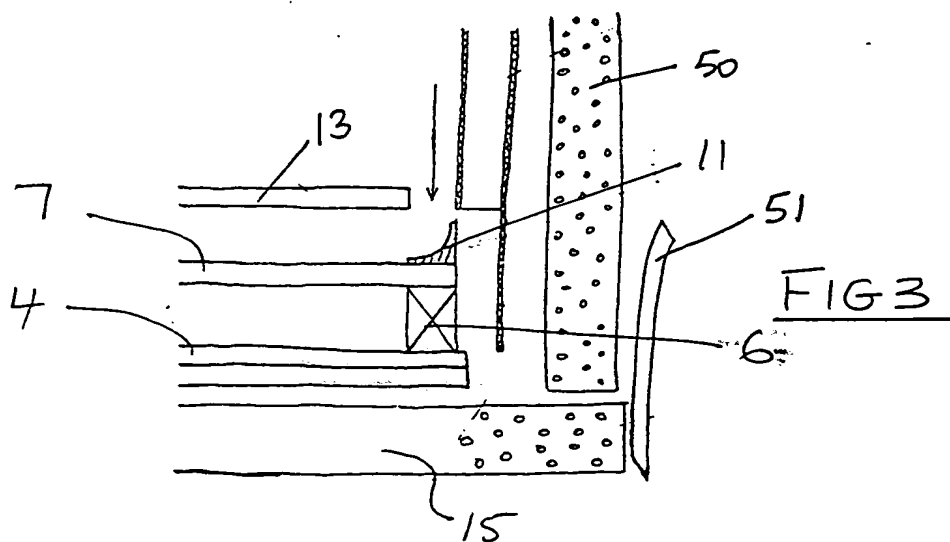
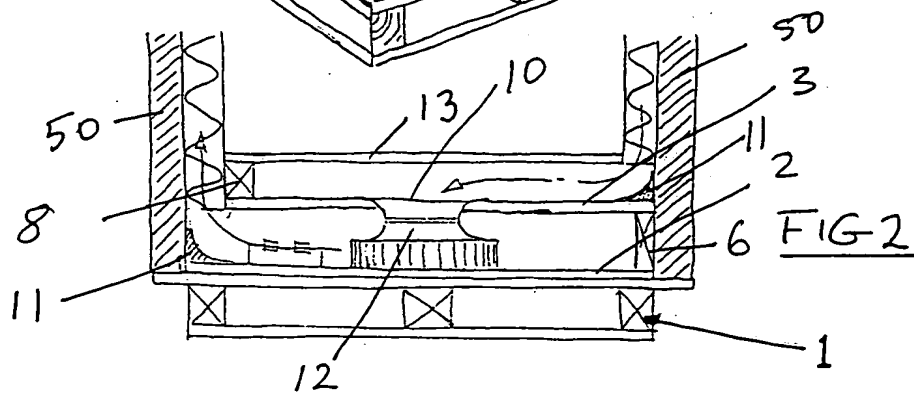
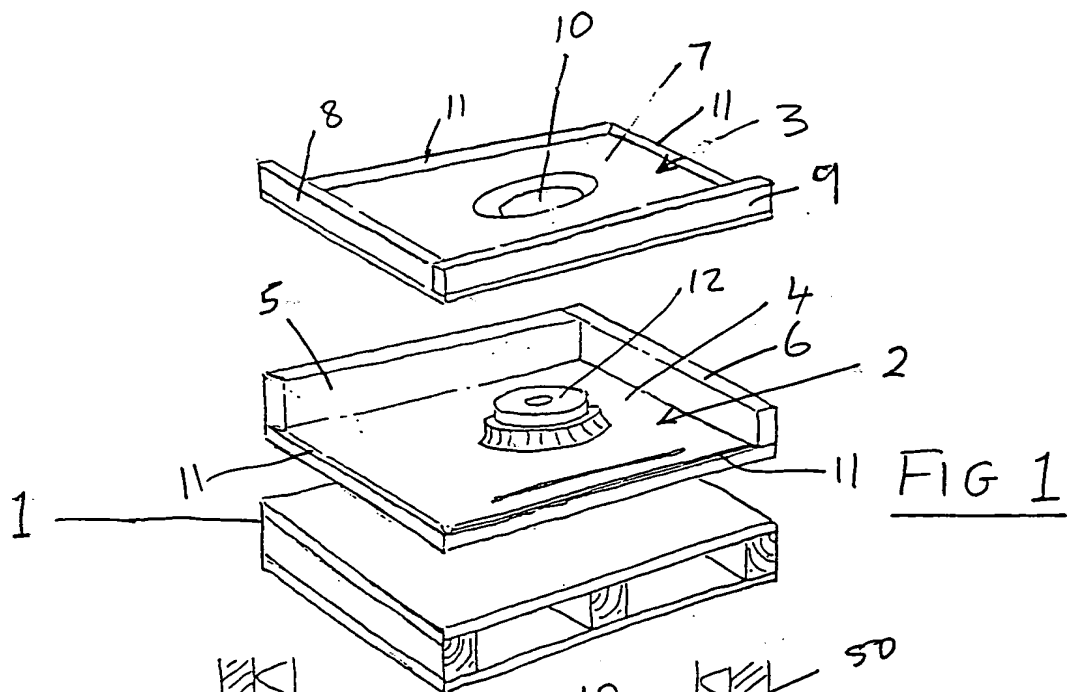
In Figure 17 (a) the parts of the container are shown arriving. In 17 (b) produce is stacked onto a pallet 1, and in (c) the produce is wrapped for example using shrink film.

In (d) to (f) the first of the gas directing panels is folding into shape and in (g) is placed over the produce. In (h) the second panel also folded is placed over the first panel and these are
5 sealed at (i). In (j) to (l) a similar procedure is followed with insulation panels which also extend over the pallet 1. Drawings (m) to (n) show the loaded container of the invention being lifted and loaded into a larger shipping container.

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PIPERS

Attorneys for:



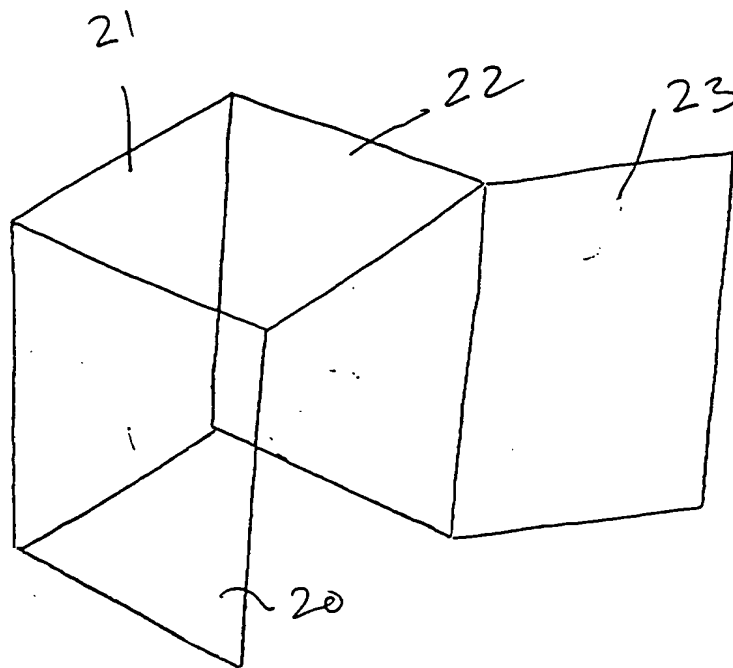


FIG 4

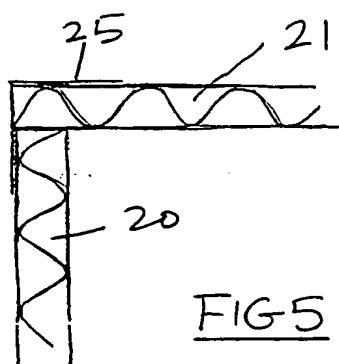


FIG 5

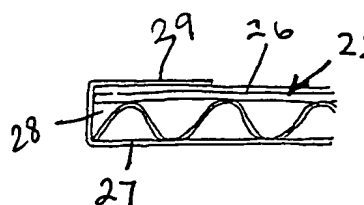


FIG 6

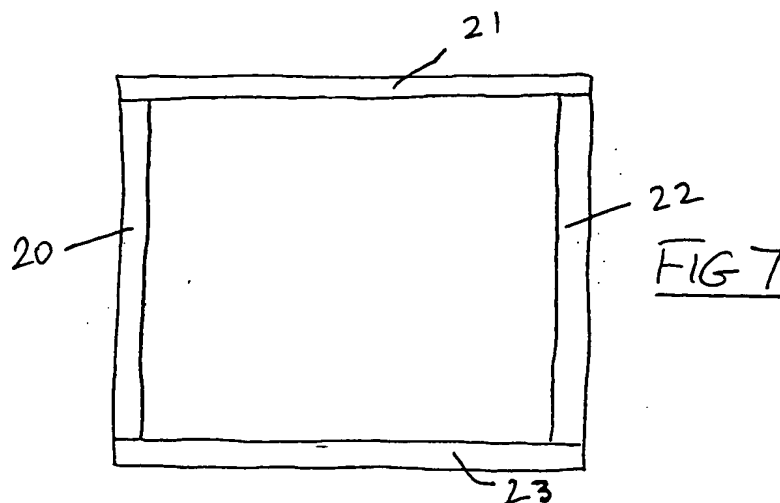


FIG 7

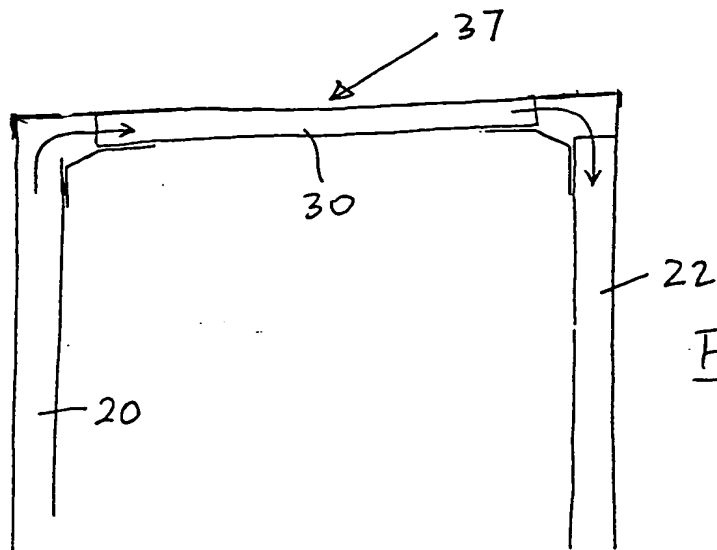


FIG 8

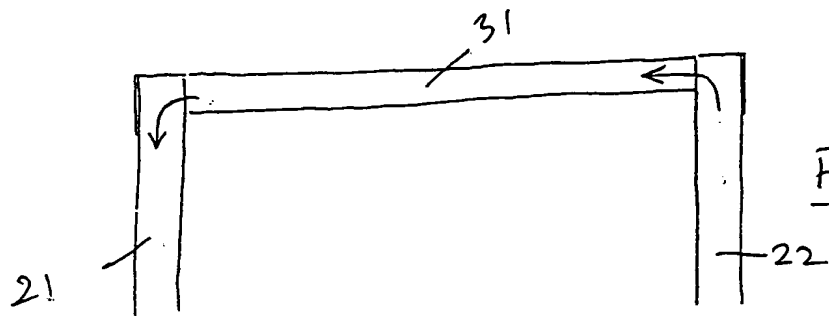


FIG 9

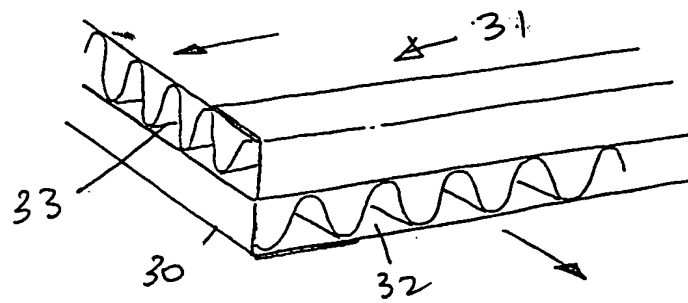


FIG 10

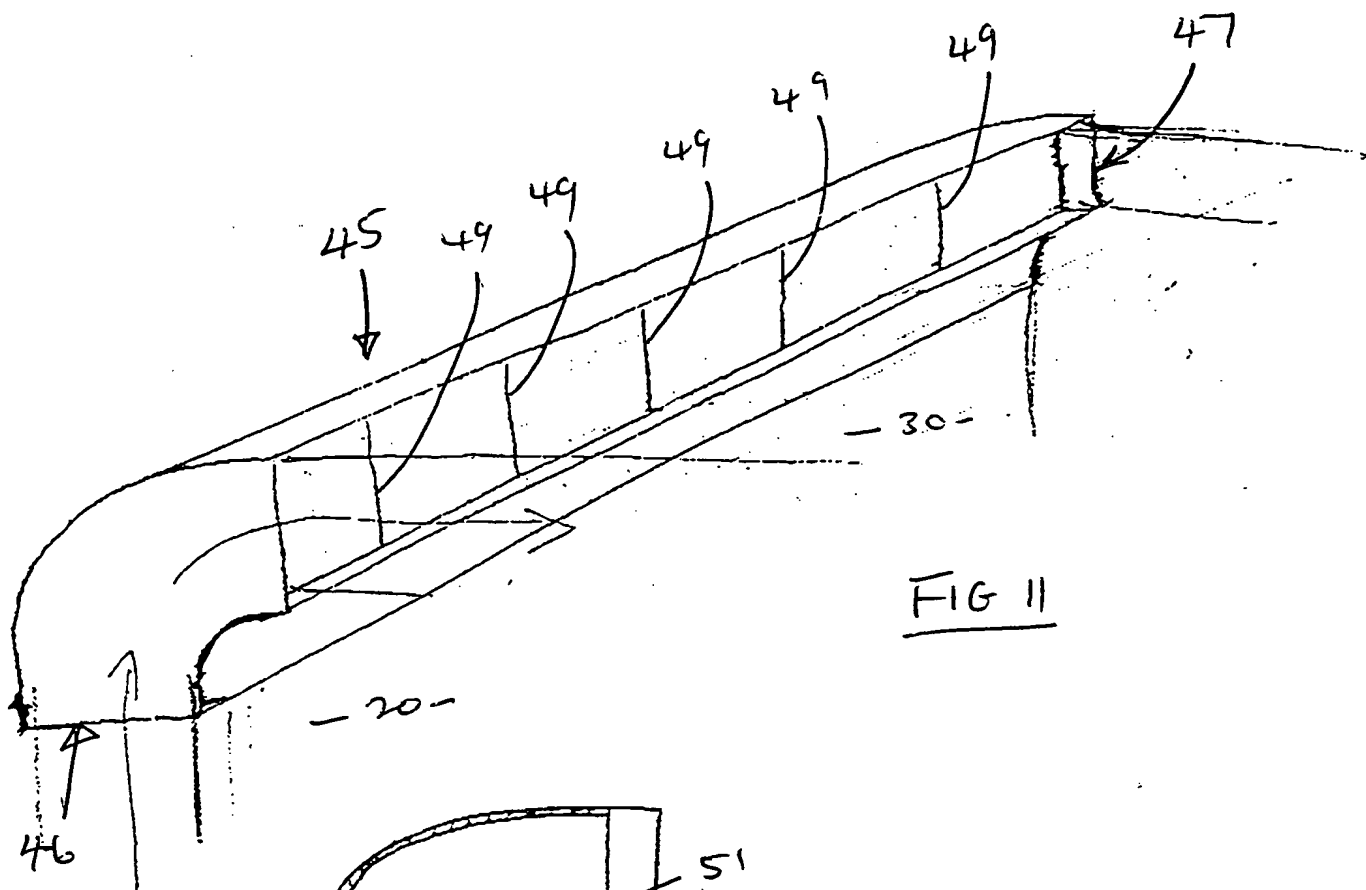


FIG 11

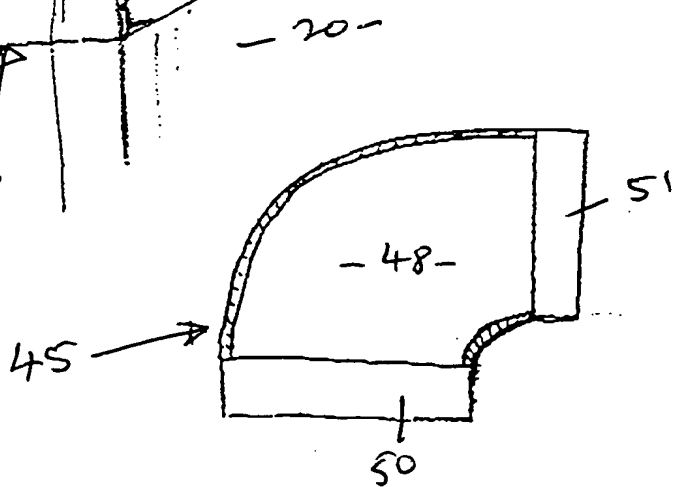


FIG 12

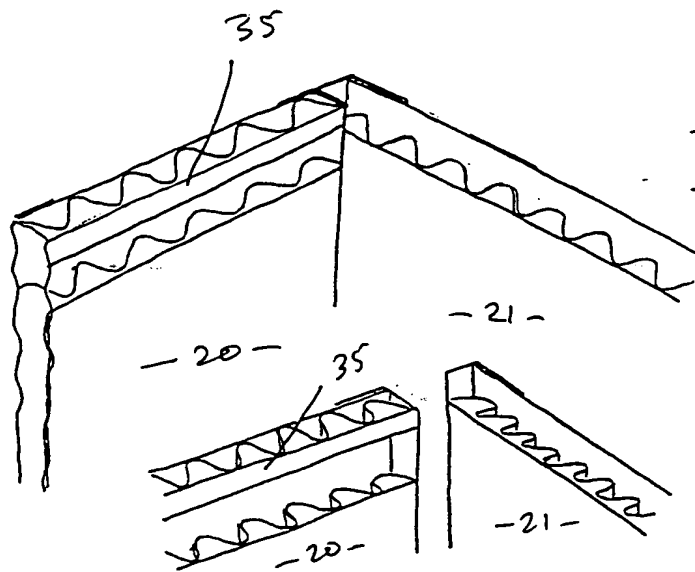


FIG 12

FIG 14

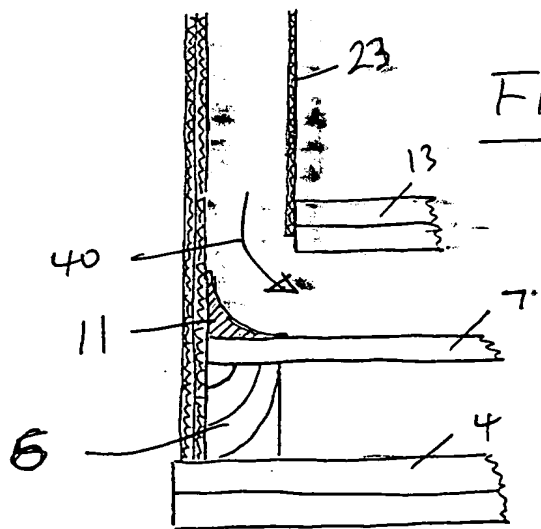


FIG 15

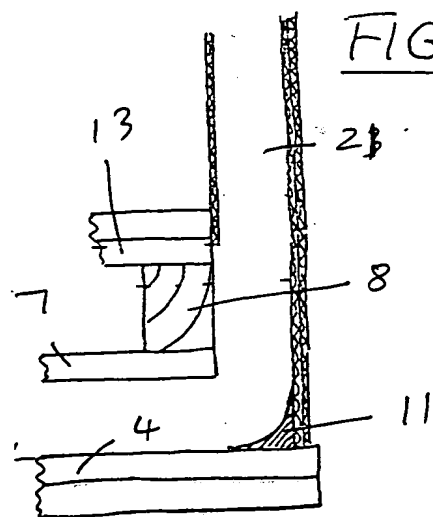
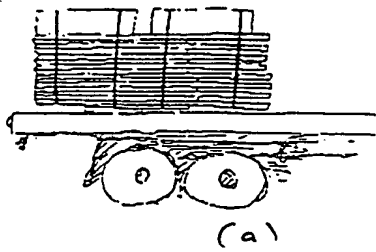
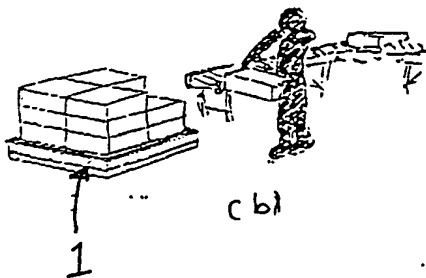


FIG 16



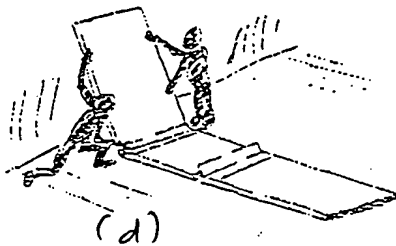
(a)



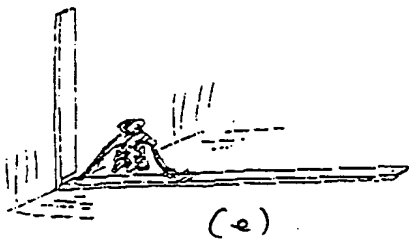
(b)



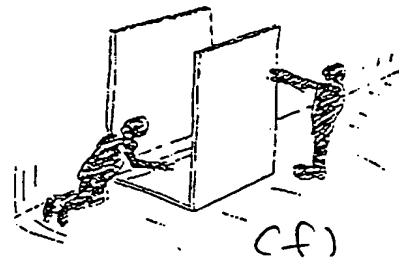
(c)



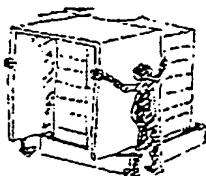
(d)



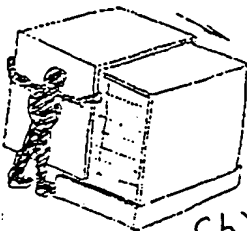
(e)



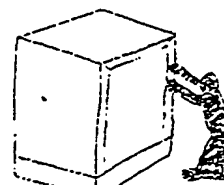
(f)



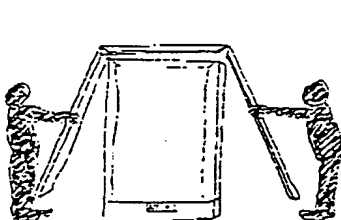
(g)



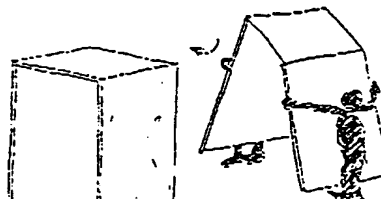
(h)



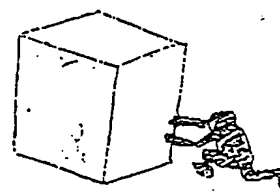
(i)



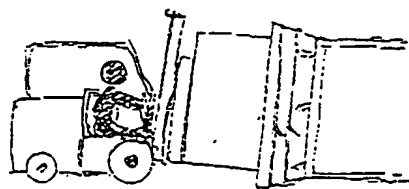
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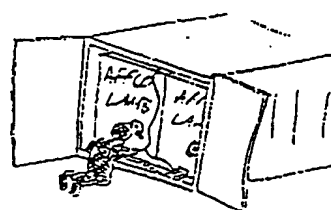
(k)



(l)



(m)



(n)

FIG 17

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